Northumbria University NEWCASTLE

The study explored the impact of switching meat for fungi-based mycoprotein. Image credit: Quorn (Vegetarian chilli con carne made with Quorn mycoprotein)

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Swapping meat for Quorn's mycoprotein may protect against bowel cancer, says study

Researchers from Northumbria University have found that swapping red and processed meat for Quorn's mycoprotein, a fungi-based meat alternative, leads to a significant reduction in intestinal genotoxins - which can cause bowel cancer - and increases healthy gut bacteria.

Their study, published in the *European Journal of Nutrition*, explored for the

first time the effects of replacing a high red and processed meat intake with mycoprotein on the levels of cancer causing chemicals, known as genotoxins, found in the intestines, as well as the impact on gut health.

The randomised clinical trial followed 20 healthy male adults aged 18-50 and was split into two distinct phases. The meat phase saw trialists consume 240g of red and processed meat - including beef steak, pork sausages and ham slices - each day for a two-week period. For the mycoprotein phase, they consumed the same weight in fungi-derived mycoprotein equivalents over a separate two-week period, with a 'washout' period of four weeks between the two phases.

Analysis of stool and urine samples from the mycoprotein phase revealed that levels of detected genotoxins like nitroso compounds (NOC) and p-cresol - chemical contaminants that have been found to be potential cancer risk markers - were significantly reduced. Conversely, results from the meat phase showed that genotoxin levels had risen, potentially increasing the long-term risk of bowel cancer, which is also known as colorectal cancer. The difference between the meat and mycoprotein phases was statistically significant.

As well as delivering significant reductions in harmful genotoxins, the mycoprotein diet was also found to significantly improve gut health, increasing the abundance of protective bacteria such as *Lactobacilli, Roseburia, and Akkermansia,* which are associated with offering protection against chemically induced tumours, inflammation and bowel cancer.

In contrast, findings from the meat phase revealed an increase in gut bacteria linked with issues such as cancer, cardiovascular diseases, weight gain and other negative health outcomes.

Epidemiological data consistently associates red and processed meat with an increased risk of bowel cancer, leading to recommendations from both EATLancet and the International Agency for Research on Cancer (IARC) to reduce meat consumption[1],[2].

Commenting on the findings, lead researcher Dr Daniel Commane, Associate Professor in Nutritional Sciences at Northumbria University, said:

"Bowel cancer is the fourth most common cancer in the UK, with more than

40,000 new cases each year[3], and data consistently associates red and processed meat consumption with increasing people's risk.

"As previous studies had identified that reasons for this enhanced risk include the fact that meat increases genotoxicity and, potentially, reduces fibre intake due to it commonly displacing plant foods, we wanted to explore the impact of switching meat for the fungi-based mycoprotein when it came to bowel cancer risk.

"The study showed that this dietary change delivers a significant reduction in genotoxicity and an increase in beneficial gut microbes. Our findings suggest therefore that this high-fibre protein source provides a good alternative to meat in the context of gut health and could help to reduce long-term bowel cancer risk."

The trial was investigator blind, meaning the researchers did not know which group had which diet, and participants were screened for any gastrointestinal diseases or use of medication that might affect their gut/intestine, along with other conditions like coronary artery disease and diabetes. Participants were also asked to avoid consuming any other meat or Quorn mycoprotein products other than the supplied study foods, as well as any additional high protein, fibre or probiotic supplements, during the trial.

Tim Finnigan, Scientific Advisor for Quorn Foods, said: "This latest study adds to the growing body of evidence that the nutritious protein source that is mycoprotein offers substantial health benefits, protecting against a range of diseases and conditions.

"With official dietary advice encouraging everyone to consume less meat to improve the health of people and our planet, alternatives such as Quorn's mycoprotein, which has an excellent nutrition profile, being high in protein and fibre, low in saturated fat and free from trans-fat and cholesterol, is really important. While many meat alternatives are plant-based, mycoprotein is fungi-based which, emerging evidence suggests, brings a range of additional benefits to metabolic health."

Academics from Northumbria's Nutrition and Food Research Group are continuing to investigate the impact of mycoprotein on gut health. In particular, they are interested in understanding how the gut uses fibres in mycoprotein, such as chitin, beta glucan and mannan, and whether they

might help train our immune systems or aid in lowering cholesterol levels, for example. The research team also said that further studies are needed to look at the impact of mycoprotein on gut health in different participant groups, disease or health states, and with other gut health outcomes.

This study is the latest to demonstrate how Quorn's mycoprotein delivers significant health benefits, including appetite regulation for those with obesity and type 2 diabetes, muscle growth and reducing cholesterol levels.

You can learn more about the study findings here. Visit the Quorn Nutrition website to learn more about Quorn mycoprotein.

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References

[1] Bouvard et al, Carcinogenicity of consumption of red and processed meat, The Lancet Oncology, 2015

[2] Willett et al, Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems, The Lancet, 2019

[3] Cancer Research UK, Bowel cancer statistics [accessed 2nd February 2023)

About Quorn mycoprotein

Quorn's mycoprotein is a nutritious complete protein source with a meat-like texture that is made from a naturally occurring fungus called fusarium venenatum.

The fungus is sourced from the soil and fermented with nutrients made from maize, wheat and essential minerals to create a food that is high in protein and fibre, low in saturated fat and free from trans fat and cholesterol.

Research suggests that, as well as its excellent nutrition profile, the structural complexity of mycoprotein's cell wall, which is retained through the production process, may explain why it is so good for metabolic health. It is also a complete protein, meaning it contains all of the nine essential amino

acids needed by our bodies.

The natural properties of fusarium venenatum, which again are retained through Quorn's production process, mean that mycoprotein is also a source of nutrients including riboflavin, folate, phosphorus, Zinc, Choline and manganese.

About bowel cancer

Bowel cancer is also called colorectal cancer. It affects the large bowel, which is made up of the colon and rectum.

Facts and figures about bowel cancer

- Bowel cancer is the fourth most common cancer in the UK and the second biggest cancer killer.
- Nearly 43,000 people are diagnosed with bowel cancer every year in the UK.
- Around 268,000 people living in the UK today have been diagnosed with bowel cancer.
- More than nine out of ten new cases (94%) are diagnosed in people over the age of 50, and nearly six out of ten cases (59%) are diagnosed in people aged 70 or over. But bowel cancer can affect anyone of any age. More than 2,600 new cases are diagnosed each year in people under the age of 50.
- 1 in 15 men and 1 in 18 women will be diagnosed with bowel cancer during their lifetime.

For more information on bowel cancer, visit Bowel Cancer UK

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